Multiple Benefits of Emission Reduction Policies

Regional air pollution and global climate change are separate environmental problems, but their causes and solutions are closely linked. By crafting smart policies that recognize the multiple benefits—also called "co-benefits" or "co-control benefits"—of actions that reduce both air pollution and greenhouse gas emissions, state and local governments can achieve a wide range of environmental, public health, and economic goals efficiently.

The burning of fossil fuels results in the emissions of greenhouse gases and air pollutants that cause problems like acid rain and smog. When fossil fuels are used more efficiently, or when they are replaced by non-fossil energy sources such as solar or wind power, both air pollution and greenhouse gas emissions may be reduced. Extraction and processing of fossil fuels also result in discharges of water pollutants and generation of solid wastes. So policies and programs that cut emissions of greenhouse gases by reducing fossil energy use not only limit long-term global climate change, but also reduce air pollution, improve the quality of air and water, and reduce risks to human health.

For example, the city government of Philadelphia replaced approximately 28,000 traffic signal lights with energy-efficient signals that employ light-emitting diodes (LEDs). The project is expected to avoid annual emissions of 80 tons of sulfur dioxide (SO_2) and 25 tons of nitrogen oxides (NO_x), reducing energy costs by $887,000 and maintenance costs by $165,000 annually. It also will reduce greenhouse gas emissions by avoiding an estimated 7,000 tons of carbon dioxide (CO_2) annually. The project helps improve Philadelphia's air quality and public health while trimming greenhouse gas emissions and the city's overhead costs.

By looking at the complete picture of benefits that result from a particular policy or set of policies, state and local agencies can achieve significant environmental results. Yet governments often take a compartmentalized approach, developing separate programs to control either air pollution or greenhouse gas emissions without accounting for the impacts that such programs may have in addressing both of these environmental problems. Such approaches often prevent agencies from taking credit for the ancillary benefits that a policy may have toward different environmental objectives. Agencies thus may lose the opportunity to make a stronger case for why a certain policy or program should be supported instead of, or in addition to, other types of actions.

States and localities deal simultaneously with many economic, social, political, and environmental issues. In the competition for attention and funding, only those issues with the greatest cost or benefit to society are likely to make it onto the agendas of decisionmakers. By including potential greenhouse gas benefits in the consideration of air quality policies and programs, decisionmakers may find an additional incentive or motivation to take actions that improve air quality. Alternatively, officials taking actions primarily to reduce greenhouse gas emissions may gain more support by emphasizing the benefits the actions have in other areas, such as achieving national air quality and water quality standards or improving public health.

Once policymakers discover that greenhouse gas reduction policies have payoffs for local air quality, water quality, health, waste disposal, congestion, and economic development—in other words, that those policies can help solve multiple environmental issues—they are more likely to take action. Air quality and public health co-benefits can bring direct and immediate results to states and communities. In comparison, the benefits of climate protection alone may seem distant, uncertain, and intangible, making it difficult to convince local decision-makers and the public of the need to take immediate action. By including multiple benefits in the greenhouse policy equation, policymakers can strengthen the argument for taking action now on climate change instead of delaying until sometime in the future.

Examples of Policies with Multiple Benefits

The multiple benefits of smart policies that simultaneously reduce greenhouse gas and air pollution emissions include:

Public Health

- *Improved respiratory health.* Actions that reduce air pollution have significant benefits for public health. For example, EPA estimates that reductions in particulate matter and ozone through implementation of the Clean Air Act avoided approximately 184,000 premature deaths in 1990, along with 674,000 cases of chronic bronchitis, 850,000 asthma attacks, and 8.7 million cases of acute bronchitis in children. Efforts to reduce motor vehicle use also have compelling health benefits: motor vehicle pollution causes an estimated 11,500 premature deaths annually.
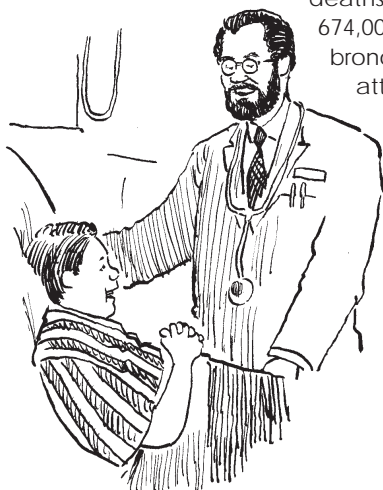
Environmental

- *Better air quality through improved compliance.* By reducing greenhouse gas emissions, states and municipalities will reduce other pollutants and compliance costs associated with air pollution. For example, if all profitable energy efficiency upgrades were performed in state and local government buildings in the United States, NO_x emissions would be reduced by 120,000 tons a year and SO_2 emissions by 300,000 tons a year.

- *Reduced environmental costs associated with air pollution.* Efforts to reduce greenhouse gas emissions and air pollution from energy use help prevent urban smog and acid rain. Cities and states incur costs from acid rain and smog, which adversely affect trees, wildlife, natural ecosystems, agriculture, and structures and equipment such as buildings and cars.

- *Improved water quality from reduced nitrogen deposition.* In areas with significant problems with nitrogen deposition, policies to reduce greenhouse gas emissions and air pollution may slow eutrophication and other water quality problems.

- *Reduced climate change.* Actions that reduce greenhouse gas emissions will help to limit future climate change. Potential impacts of global climate change include sea level rise, changes in precipitation patterns, disruptions to natural ecosystems, and an increase in the frequency and severity of extreme weather events including heat waves and their associated mortality.

Economics

- *Reduced energy costs to households, businesses, organizations, and governments.* Energy efficiency saves money while reducing greenhouse gas emissions and air pollution. The 200-plus state and local agencies that participate in the ENERGY STAR® Buildings and Green Lights® Partnership save more than $36 million annually while reducing SO_2 emissions by 6,700,000 pounds and NO_x by 2,700,000 pounds annually. For the United States as a whole, ENERGY STAR products like home electronics reduced energy consumption in 1998 by about 16 billion kilowatt-hours, avoided more than 3 million metric tons of carbon emissions, and saved consumers more than $1 billion.

- *Lower material costs and disposal fees because of recycling and source reduction.* Texas diverts roughly 11 million tons of waste from its landfills each year through recycling, saving $275 million annually in dumping fees. Boosting recycling rates is an effective strategy for reducing greenhouse gases: New Jersey estimates that its recycling programs avoided 8.7 million tons of greenhouse gas emissions from 1990 through 1995.
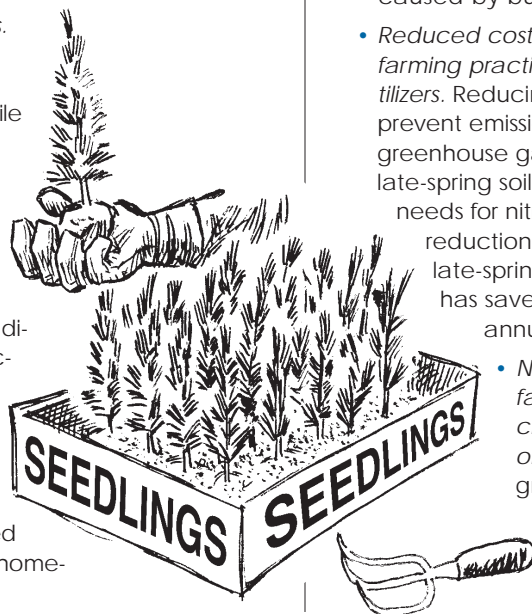
- *Lower maintenance costs required for alternative technologies such as electric cars and efficient fluorescent lights, compared with conventional products.* For example, the City and County of Denver, Colorado, saved energy and maintenance costs by installing new traffic signals that last 12 times longer than standard ones.

Land Use

- *More efficient use of land within communities.* Reducing vehicle miles traveled can make communities more livable while reducing greenhouse gases and air pollution. For example, the City of Xenia, Ohio, and Greene County, Ohio, converted 60 miles of former railway corridors and a railroad depot into an alternative transportation center with bike and pedestrian trails, parking facilities, and a community building. Every gallon of gasoline saved by these measures prevents 20 pounds of CO_2 from being emitted to the atmosphere.

- *Less urban sprawl, preserving the vibrancy of downtowns, and conserving valuable open space and farmland outside cities.* In 1995, a citizens group in Oregon convinced government agencies to scrap plans for a bypass around the southwest side of Portland, replacing the bypass with light rail transit, high-frequency bus service, and walking and bicycling facilities. By reducing vehicle miles traveled, the bypass helps reduce Portland's greenhouse gas emissions and air pollution while using land more efficiently.

- *More walkable cities and towns.* Mixed residential and commercial areas can reduce car use by enabling consumers to walk to corner stores instead of driving to distant chain retailers.

Forestry

- *Greener cities and towns.* Trees can be planted to remove carbon dioxide from the atmosphere while making urban areas and towns more attractive.

- *Reduced summer cooling costs through strategic tree planting.* Trees can provide shade for buildings, window air-conditioners, and streets, reducing the amount of energy needed to cool buildings. In the Miami Lakes neighborhood of Miami, the city planted 88 trees scattered among 14 homes. Each home-

owner has saved $20 per year in energy costs while reducing the neighborhood's annual energy-related carbon dioxide emissions by 42 tons.

- *Sustainably managed forests.* The regional planning agency for metropolitan Portland, Oregon, has joined forces with a consortium of electric utilities to reforest metropolitan open space and parkland for carbon storage. The utility consortium helps the agency pay for tree planting and other costs associated with forest establishment. In return, the consortium gains the rights to the greenhouse gas benefits that accumulate as the trees grow.

- *Reduced urban heat island effect and reduced urban runoff.* Declining tree cover is a major cause of increasing urban temperatures. Materials such as asphalt store much of the sun's energy and remain hot long after sunset. The result is called the "urban heat island." Soil and tree roots also act to reduce stormwater runoff. Planting more trees can keep communities cooler, reduce runoff, and lower greenhouse gas emissions and urban air pollution.

Agriculture

- *Reduced energy costs to farmers from improved energy efficiency in farm building operations and farm equipment.* A typical 500-cow dairy in Florida produces 25,000 pounds of milk and requires 450 gallons of 160° F water every day to wash out the milking system. By installing precoolers and heat exchangers to remove heat from milk to use for heating water, a farmer can save more than $2,000 per year in electricity costs or $750 in liquid propane costs at a 500-cow dairy. These savings reduce greenhouse gas emissions and air pollution caused by burning fossil fuels.

- *Reduced costs to farmers through alternative farming practices such as the strategic use of fertilizers.* Reducing the use of nitrogen fertilizer helps prevent emissions of nitrous oxide, a powerful greenhouse gas. Pennsylvania farmers who use a late-spring soil test to determine their farms' needs for nitrogen fertilizer report a 40 percent reduction in their use in the five years since late-spring soil testing began. This practice has saved 28 million pounds of nitrogen annually statewide.

- *New potential source of income for farmers from the use of agricultural crops for biofuels such as methanol or biodiesel.* Energy crops could be grown on the 50 million acres of idle farmland in the United States to reduce greenhouse gas emissions by displacing fossil

fuels with sustainably grown fuels and improve national energy self-reliance. These energy crops represent the nation's largest potential biofuel resource.

- *Reduced energy costs for farms through processing of livestock waste to produce power.* Craven Farms of Cloverdale, Oregon, annually produces $24,000 worth of electricity and $30,000 worth of digested solids with its biogas system. The system reduces methane emissions from manure and CO_2 emissions from electricity production. Maximizing farm resources in this way may help farmers remain competitive and environmentally sustainable in today's livestock industry.

Conclusion

The bottom line is that regardless of the motivation for action, policies and programs that reduce air pollution and greenhouse gas emissions bring tangible and immediate benefits to communities, businesses, and individuals. Actions to control air pollution have greenhouse gas benefits, and actions to reduce greenhouse gases have air pollution benefits. Even though the benefits of reducing greenhouse gases currently are uncertain and controversial, the ancillary benefits are reason enough to take action.

Smart policies like the ones described here are true "no regrets" actions: even if global warming weren't an issue, these policies would make economic and environmental good sense.